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JOHN VAN TIGGELEN

Once it was the Americans the rest of the world looked up to - literally. Now the Dutch hold the mantle as the world's tallest people, and their growth spurt shows no signs of slowing. John van Tiggelen visits the land of the giants to find out why.

Each time I return to the country of my birth, I am reduced in stature. Going home can have this effect on anyone, families being the brute levellers that they are, but I'm talking actual centimetres. Every few years, in the half hour it takes me to alight from the aircraft and be channelled underground to the trains at Amsterdam's Schiphol airport, I sense I have yet again lost height to my compatriots.

It's slightly unnerving, this shrinking feeling, as if I'm ageing prematurely. I did not leave the country a short boy. I did not grow up in Australia to be a short man. Yet in the 31 years since emigrating, my adult height has slip-ped from 2.5cm - a neat inch - above the Dutch national average, to 2.5cm below. Not only are the Dutch now the world's tallest people, they are getting loftier still.

Something is clearly up. But what? A modern take on an old joke is that it's a response to global warming, so the Dutch might keep their heads above water when rising seas reclaim their sunken country.

A more clinical assessment depends on who you ask. Ask a dietitian and she'll nominate the Dutch consumption of dairy products which, according to the International Dairy Federation, is the highest per capita in the world. Ask a pediatrician and he'll nominate the Dutch child health-care system, which again is second to none. Ask a GP and he'll put in a rap for immunisation and sanitation. And ask my tallest cousin, a city veterinarian, or even my shortest cousin, a village vegetarian, and they'll raise the spectre of growth hormones supposedly used to beef up cattle and chunk up chickens. (Although I could find no endocrinologist who'd back this up; it's almost certainly an urban myth. Even if such hormones were administered routinely to animals, it's highly unlikely they'd be passed on in their active form.)

I also asked Maud Koomen, who runs BeLong, a clothes shop for tall women near The Hague. Koomen is 190cm tall, of tall parents and a 181cm grandmother, with five kids of her own whose heights range from 180cm to 205cm. She has raised another four foster children, who grew to an average of 170cm. "It's in the genes," she says, without a flicker of doubt.

Yes and no, says Professor George Maat, who has busied himself with the subject for the past 30 years. But mostly no. Height may well run in families, yes. Much more rarely it runs in peoples, whose height may be an adaptation to climatic or other conditions - hence a pygmy raised in the Neth-erlands on a diet of cheese and herring is unlikely to become long of limb (though he'll doubtless be taller than if he'd remained in the Congo). But genetics by themselves do not explain why the Dutch are so tall, because, until relatively recently, the Dutch weren't so very tall at all.

PROFESSOR MAAT IS AN ANATOMIST AND FORENSIC ANTHROPOLOGIST IN THE university town of Leiden, Holland's Oxford. From his upper-floor laboratory, which is filled with sunlight and bones, he can also keep an eye on the living. Being students, they are disproportionately young, fit and privileged. They are also inordinately tall. Girls glide by high in the saddle, their legs so long they make cycling look languid. Young men can't help but lope.

Maat himself is a dapper fellow - tall by any but his undergraduates' standards - whose moustache matches his bow-tie in size and shape. On his workbench a skeleton lies neatly arranged. Maat (whose name means "measure" in Dutch) shows me how, after death, a cadaver gains a centi-metre or two due to collapsing muscle tone and flattening of the spine, and then loses the extra centimetres with the disappearance of skin on the scalp and soles of the feet. "So the skeleton length is the same as the standing height," says Maat. "Which is handy for my research."

His interest in the evolving height of his compatriots began when a restoration at a nearby church uncovered an ancient graveyard. Maat went in to measure the skeletons. Sixteen cemeteries later, he had data stretching back two millennia. What he found surprised him. Back in Roman times, Dutchmen averaged 176cm in height. For the next 1800 years, however, as population densities increased and diseases became more rife, their stature underwent a decline of about half a centimetre every century so that by 1850, the men of Leiden averaged just 166cm. Scandinavians and Americans were up to 10cm taller. Only in the late 19th and early 20th century, with advances in sanitation, food preservation and vaccination, did the Dutch catch up a little.

"The acceleration in growth really came very late in the piece," Maat tells me. Since World War II, large-scale national surveys staged every 15 years or so have shown the Dutch getting taller at a mean rate of 2cm a decade. "The average 21-year-old Dutchman is now 185cm and the average woman is 172cm [based on projections from the last national survey]," says the professor. "How tall are you?"

I'm 182cm, I tell him.

"You're nothing!" he jibes. "How old were you when you migrated to Australia?"

Eight. Why?

"It probably stunted your growth." He's laughing, so I assume he's joking. Then again, young Australian men average 178cm, and women just 164cm. Australians, like Americans, are evidently more efficient at piling on kilos than centimetres.

Maat believes that in a few more decades, Dutchmen will likely average 190cm. "And that is really, really huge," he says. "Where will it end? My gut feeling is that I'd be surprised if we go over [a mean of] two metres. But if you asked me 30 years ago when I started my research, I'd never have thought 190cm was possible. Let's not forget, horses started out the size of dogs."

FIVE PER CENT OF DUTCH CITIZENS, OR 800,000 OF them, qualify for an organisation that calls itself the Club of Tall People, or KLM (Klub Lange Mensen). The cut-off for membership is 180cm for women and 190cm for men. As well as lobbying businesses (including KLM, the Dutch airline) to make more leg-room for members, the club publishes a consumer magazine called Op Maat (To Length), which reviews campervans, hotels, tents, cars, kitchens, public transport and even toilets from the lofty perspective of one of its own. It also promotes Miss Tall Fashion, an annual pageant for labels such as Longitude, Relieve and High & Mighty.

Agnes Brunninkhuis is one of the club's directors, though she's not that keen on the specialist fashion houses. Too prissy, she reckons. She prefers to buy her jeans from men's stores.

Brunninkhuis is a big-boned, square-jawed woman who smokes Marlboros and wears size 12 sneakers. Whenever she flies, she sits in the flight attendant's chair opposite the other passengers in order to be able to accommodate her legs. At her family's home in one of Amsterdam's satellite towns, she shows me how the kitchen bench, showerheads, toilet bowls and washbasins have all been raised. Door lintels have a clearance of 230cm, in keeping with building standards recently revised to protect the foreheads of the towering populace.

The Brunninkhuis's immigrant cleaner, however, remains Lilliputian. In the hallway Brun-ninkhuis looks down on a wardrobe and wipes her finger across the top. "She doesn't see the dust that we see," she says.

Brunninkhuis is one of 10 children. Her short-est sister is 184cm, the same size as their mother. Her tallest brother is 210cm - almost seven feet on the old scale. Brunninkhuis herself is 191cm; her husband Henk is even taller, at 193cm. Such a pedigree means that, like many Dutch children, their 11-year-old son Kai has had an X-ray taken of his hand to determine the extent of cartilage in his bones, which is used to predict his adult height. At this stage the radiologist's guess is about 200cm.

"Two metres is normal for a man," says Brun-ninkhuis, with a shrug. "That's okay." But their daughter Brit may also outgrow them. Brun-nin-khuis shows me Brit's growth curve, which charts well above the norm. At seven, she has the skeleton of a 10-year-old. "When they said she might grow to two metres as well, we were planning to intervene," says Brunninkhuis. "That sort of height is problematic for a woman." Intervention involves the administration of oestrogen, the female maturation hormone, to bring on menstruation and slow Brit's growth. "We had to ask, is she ready for that, emotionally?" says Brunninkhuis. "Or would the emotional cost of being two metres be worse?" Fortunately, Brit's rate of growth has slowed in the past six months and hormonal intervention is off the agenda, for now. "She's only going to be about 190cm now, it seems."

Shortly, Brunninkhuis takes me to meet her "girls". Brunninkhuis manages a top-league women's volleyball side, Amstelveen. Volleyball is one of Holland's most popular sports, along with football, hockey and ice-skating. (Curiously, basketball has never really caught on.) In a brown-brick clubroom, the girls sit around a table for a pre-match conference. I'd expected a clutch of amazonian Amelie Mauresmo types, but, as a group, the Amstelveen girls look more like cheerleaders. Until they stand up.

One of the ganglier girls is Marjolein Meinders who, at 10, was offered the choice of hormone treatment or growing to 195cm. "For me it was not such a difficult choice. I was already good at volleyball and my team-mates were tall. But I had a friend in the same boat who did not play volleyball. She decided to take the hormones. She's 185cm now. I'm 191cm."

Another friend of hers, Floortje Meynders, plays for the national team. At 13, she began swallowing oestrogen tablets to curb her growth spurt, then quit six months later when she made the national youth squad, which judges teenagers' potential by their height and shoe size. Meynders didn't have another period until she was 16. "I don't know if the hormones had an effect but I'm very happy with my 190cm," she tells me later. "My brother looked like growing to 210cm so was given testosterone injections. He finished up on 202."

Dr Gianni Bocca is a child endocrinologist in Groningen, in the very north of Holland, where the people are reputed to be the tallest in the land. His clinic treats about one child a week with hormones. The term "treating" is used loosely; it's really a case of premature ripening. "There are no medical reasons for intervening in [the growth of] these kids," Bocca concedes. "The reasons are practical and cosmetic. Often it's the parents who feel the kids are too tall, rather than the kids. It's clear from the words they use: 'How tall does my daughter threaten to become?' If a girl is estimated to grow over 185cm, or a boy over 205cm, then we offer them the choice [of treatment]."

Possible side effects include weight problems, acne and aggression. I mention that the Amstel-veen girls believe it flattens the figure, based on what they've seen happen to their friends. "It's possible. We don't know the long-term side effects," Bocca replies candidly, if somewhat surprisingly, because around the world, including in Australia, tall girls have had their growth stunted with hormones since the '60s. "All we have is an Australian study [from 2004] which found treated women were more likely to have fertility problems. I always make sure I mention that."

HEIGHT MATTERS, APPARENTLY. NUMEROUS studies in various countries reveal tall men and women are luckier in love, longevity, leadership and earning capacity. Controversially, an American study last year reportedly attempted to explain all this by suggesting taller people were smarter. The authors of the study, two Princeton economists, theorised that whatever was good for the body, as reflected by growth, was good for the brain. This was pure pop-biology - brain development has little to do with growth, as Leiden's George Maat is quick to point out. He suspects the authors might have done better to stick to socioeconomics in explaining the link between stature and status. After all, a child whose parents can afford an optimum diet and the very best health care is more likely to get a top education.

Indeed, the high priest of height science, also known as auxology, or anthropometric history, is an economist. John Komlos, who is also a historian, edits the field's chief journal, Economics and Human Biology.

The link between height and economic prosperity was first noted by the French statistician Louis Villerme. "Physical stature is greater, and men grow faster, the wealthier the country. In other words, misery produces short people," he wrote back in 1829. Komlos, a Hungarian Jew who almost starved to death in Nazi Germany, was struck by the same stark realisation upon arriving by boat in America 50 years ago: his people, Holocaust survivors, were short and poor; his hosts were rich and tall.

Komlos's ongoing work has spawned many disciples, or auxologists, foremost among whom - in the Netherlands - is Vincent Tassenaar. Tassenaar's fascination is not so hard to fathom. "I am 159.6cm," he says, almost by way of greeting. In fact, he is a member of the Club of Short People. Every day, he must inject himself with growth hormones to compensate for a defective pituitary gland.

Tassenaar is based in Groningen, city of giants. "There is nowhere here for me to shop [for clothes]," he grumbles, dressed in an oversized purple shirt. A few years ago Tassenaar began teasing out the ways urbanisation, with its concomitant problems of population density, tended to decrease people's health and height. By examining 33 individual districts in 19th-century Holland, he found that the height of army conscripts was connected to the local availability, and affordability, of staple foods in preceding years. Whenever the prices of potatoes, say, or rye flour went up, there would be a sharp drop in the mean height of conscripts a few years later.

"One of the strongest indicators of height was the number of cows per capita," says Tassenaar. "Butter was exported, but the milk had to be consumed locally, or it would spoil. So even the poor could afford it."

Tassenaar points out that wealth distribution, and not merely a country's net prosperity, determines the health and height of its population. Holland's so-called Golden Age of colonial expansion in the 17th century brought untold riches, yet there's not a blip in the height records to show for it - the concentration of capital meant the masses benefited not a jot.

Likewise, America's GDP may be the highest in the world per capita, but in the past 30 years the average US-born American has not grown a centimetre in height (though quite a few in girth). Women in the United States have actually shortened slightly.

In a seminal 2003 paper entitled From the Tallest to One of the Fattest, Komlos examines why Americans have lost up to 16cm (half a foot) in height compared to Western Europeans. He blames America's vast chasm between rich and poor, claiming that income disparity has eroded public health and impoverished the diet. Con-versely, could it be that the reason the Dutch are so tall is their welfare state? Or is it merely a co-incidence that the second-tallest people in the world are the Swedes?

HANS VAN WIERINGEN, A RETIRED PROFESSOR and pediatrician who, having been involved in all but one of Holland's national height surveys, has probably measured more people than anyone in the country. Even George Maat recalls being measured by van Wieringen, back when he was an undergraduate.

Van Wieringen explains that humans go through three main growth spurts - firstly as infants, then in their pre-teen years, and finally in adolescence. Where the Dutch are bolting ahead in relation to the rest of the world, and in relation to their past, is in the second spurt, between the ages of five and 10.

Van Wieringen is 80 and walks with a severe limp, a consequence of contracting polio in his boyhood. He's also 170cm tall and has no doubt the infection cost him several centimetres. "Attain-ing height is about the removal of braking factors," he says. "Such brakes may include disease, poor sanitation, large families, too little sunlight, not enough food or, more recently, too much fat in the diet. Like plants and animals, humans grow to their potential when circumstances are good."

He asks me about my parents. Both were born during World War II when Holland was under German occupation and raised in large farming families in the poorer south. Neither grew nearly as tall as their kids. "You see?" he says. "It's nothing to do with genes. It's to do with circum-stances. And the people from the south of Holland have always been shorter than those from the [Protestant] north because Catholic families traditionally had more mouths to feed."

To van Wieringen, a country's average height records are like a tree's growth rings, in that they can reflect good years and lean years. "We have now had many, many good years in Holland," he says. "But we should not say we are the tallest. Homogenously, nationally, yes. But it's not a race, and around the world there are probably sub-populations who are taller. What the Dutch have managed to do is to spread our height around more evenly."

He expects the next national height survey, in 2012, to show the Dutch have gotten taller still. But he warns it needn't last. The Dutch welfare state, like the Swedish model, is shuddering under the weight of its burgeoning proportions of retirees and immigrants. "The Swedes stopped getting taller in 1980," says van Wieringen. "What we need to remember is that height is an entirely reversible biological process. We can be short again."

The long and the short of it

In They're a Weird Mob, the 1956 book about an Italian immigrant's experience in Australia, the main character, Nino Culotta, is asked by a local, "Yer a dago, aren't yer? Bigger than most, but a dago all the same."

It's true: immigrants were, and are, typically short. And the perception persists that many of those who emigrate in waves - Mexicans, Chinese, Indians, Italians - are short because they hail from shorter races. Immigrants themselves believe it: ask, say, a Sicilian why he's shorter than a Swiss, or a Maltese why she's stumpier than a Swede, and they'll likely as not say it's because they just are - that is, because it's laid down in their people's DNA.

But read Richard Steckel, one of the gurus in the field of auxology (the study of human growth), and he's got news for you. It's the economy, silly. Most migrants, particularly those arriving en masse, are fleeing hardship or poverty. Poor people eat less well, labour harder, suffer more disease, receive less health care and therefore don't grow as tall. The Sicilians and Maltese have done it tough; the Swiss and Swedes have had it comparatively easy. Differences in prosperity likewise explain why the Portuguese look up to the Spanish, Brazilians are leggier than Bolivians, West Berliners remain taller than East Berliners - and why the English used to look down on the Irish (although not any more).

The stature of new immigrants stands in sharp contrast to that of another type of arrival who comes ashore in droves: tourists, as any Australian who has recently been to Bondi or Cairns will attest. Tourists, and backpackers in particular - some North Queensland hostels have removed their ceiling fans for fear of being sued by injured giants - generally derive from the privileged subsets of their respective countries' populations, travelling as they do with oodles of time and money on their hands.

Ralph Shlomowitz, a researcher from Adelaide's Flinders Business School, has spent considerable time in rural India, home to some of the shortest - and poorest - people in the world. Men average just 163cm and women 152cm (five feet). "They haven't increased in height in 200 years," says Shlomowitz, pointing out that their "net nutritional status" - the amount of food balanced against the amount of energy expended to get it - remains abominably low.

"Over there kids work from the age of 10, whereas here children don't work until they've stopped growing." His research further shows that the Indian diaspora in Fiji and the Caribbean is much taller. "Indians have the same genetic potential to grow as tall as Europeans," he says. "Most people do." He says East Asians may be a slight exception, in that they appear to have a genetic propensity to be shorter, but then only from the knee down to the ankle. It's also believed the lean tallness of some African people, such as the Dinka from southern Sudan, may be a genetic adaptation to climate, because having a higher surface area to body ratio makes it easier to stay cool. But, by and large, all races share the potential to grow tall - just not the resources to make it happen.

Looking at China, Stephen Morgan, an economic historian from the University of Melbourne, has shown that some of the world's fastest rates of average height increase - two to three centimetres a decade - occur in places of fastest economic growth, such as in the rapidly developing region of the lower Yangtse. And that's just in China itself; it's quite possible Chinese migrants have grown even faster, as each successive generation learns to enjoy more of the lifestyle and health benefits of their wealthy host nations. In the US, for example, it has taken just two to three generations for the traditionally short Mexicans to grow to within a few centimetres of the American average. In Australia, too, third-generation Greeks and Italians are now as tall as those who once called them dagos.

Unlike in America, where people aren't getting taller but fatter, each generation of Australians continues to be taller than the one before (about 2cm per generation in the case of men; 1cm in women), and this has occurred since the time of the gold rushes.

For the time being, Shlomowitz expects this trend to continue, as public health campaigns, such as those urging pregnant women to quit smoking and drinking, and those pushing healthier lunches in schools, come into effect.

"No one knows the limit," says Shlomowitz. "Though it's not necessarily clear that height is always healthy."

He's alluding to a Norwegian study that confirmed taller people lived longer, but possibly only to a point. The very, very tall actually lived a little shorter.

And no, it wasn't because they knocked themselves out.